THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 25. JUNE 20, 1942. VOL. 54.

General Anaesthesia in Cattle induced by the administration of Chloral Hydrate Intravenously

J. K. H. WILDE, B.SC., M.R.C.V.S., A.R.C.S.
TANGANYIKA TERRITORY

The following is presented, not as an original treatise, but as a description of an interesting experience in the use of chloral hydrate, which may serve as a guide to those practitioners who have considered the use of this drug for the induction of general anaesthesia in the bovine subject.

One of the advantages of this method of producing anaesthesia is of course the fact that operations can be carried out without the assistance of an experienced anaesthetist. This is no doubt an important consideration for the practitioner and was especially so in the cases to be described.

It was desired to operate on the leg of a valuable Friesian bull, and general anaesthesia was indicated. As the references to the method of chloral hydrate anaesthesia available were few, and referred only to equines or camels, and also as the impression obtained was that such a method is dangerous in the bovine, it was decided to make a few preliminary tests on some scrub stock of comparatively little value.*

SUBJECT No. 1.—This was a scrub Zebu ox in very poor condition. It had recently, a matter of about one month or six weeks previously, recovered from rinderpest. Its weight was 2 cwt. 1 qr. 19 lb.

Forty grammes of chloral hydrate and four grammes of sodium citrate were dissolved in sterile water to make up a solution of 400 c.c. The apparatus had been sterilised by boiling and the solution was now poured into the reservoir jar, the clip on the rubber tube being closed.

The ox was restrained in the standing position against an iron stanchion and the jugular vein on the left side was raised by means of a tourniquet after an area of the over-lying skin had been clipped. This area was cleaned thoroughly with spirit, the skin over the vein nicked with a razor, and the trocar and cannula inserted into the vein. The trocar was removed and blood spurted out.

Meanwhile, the reservoir jar had been held up and the clip on the feed tube opened just long enough to ensure that the whole tube was filled with solution and that no air bubbles existed in it. The clip was closed and the adapter fitted to the cannula. The bottle was now lowered and the clip opened until blood was seen to reach the glass window in the tube, after which, the neck tourniquet was loosened and the bottle raised. The solution was allowed to flow in slowly, until the animal sagged, when the neck tourniquet was tightened and blood passed the window in the tube. The clip was then closed, the adapter removed, the trocar inserted and the trocar and cannula withdrawn from the vein, the neck tourniquet being loosened at the same time.

All restraint was relaxed and the animal sank to the ground. Altogether 200 c.c. of solution had been injected, the time taken by the injection being two minutes.

After a short period of very shallow respiration, respiratory collapse supervened, and the animal was placed on a truck and wheeled to the autopsy room. On being lowered to the ground, respirations recommenced and the ox was supported in the sternal position in a channel running across the floor.

The following observations were now made:—

Time after Completion of Injection in minutes	Temperature	Pulse	Respiration	Remarks
10	102·4° F.	165 p.m. (weak)	32 p.m.	Complete deep anaesthesia with a stertorous fairly shallow respiration and much nasal secretion. Corneal reflex absent or very weak.
30	102° F.	145 p.m.	34 p.m.	
45	101·8° F.	130 p.m.	32 p.m.	
70	101° F.	120 p.m. (stronger)	30 p.m.	Corneal reflex now strong, but tail limp.
90	100·8° F.	—	24 p.m.	— Animal attempting to raise head and tail.
120	100·6° F.	120 p.m.	—	Respirations now steadier and deeper.
150	100·6° F.	100 p.m. (strong)	—	Attempted to rise.
210	100·6° F.	90 p.m.	—	Stood, and started to drink and eat hay.

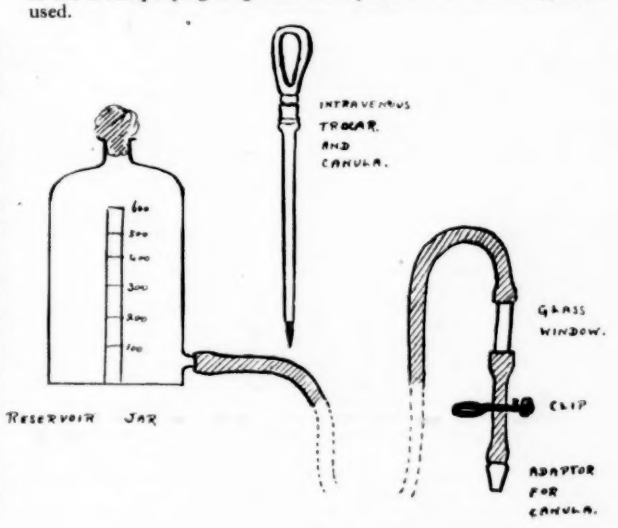
The surface temperature was maintained throughout, as far as could be ascertained by manual assessment, and a few hours after rising the ox was grazing normally.

SUBJECT No. 2.—This was a small scrub Zebu ox, in good health. Weight: 1 cwt. 3 qr. 8 lb.

The solution was made up as before, but was injected much more slowly. 50 c.c. was first injected slowly and then the clip was closed and injection was suspended for ½ to 1 minute. The clip was then opened and a further 25 c.c. was allowed to pass in and a pause of ½-minute was again observed.

The solution was then allowed to flow in very slowly, its rate being regulated by the height of the reservoir bottle, until 100 c.c. in all had been injected.

For purposes of simplification of description, attention is drawn to the accompanying diagrammatic representation of the apparatus used.



* Since writing this account I have received *The Veterinary Record* of October 11th, 1941, in which I note with interest a letter by G. T. Henderson, of Basutoland, in which mention is made of the use of chloral hydrate anaesthesia in the bovine.

After a further pause, more solution was run in until the animal sagged, after which 10 c.c. more were injected and the administration discontinued in the manner described for subject No. 1. Administration had taken about 4½ minutes, the total injected being 120 c.c.

Restraint was removed and the ox sank to the ground, but even after waiting a few minutes he did not attain a state any deeper than that between deep narcosis and light anaesthesia. After half an hour he was able to stand and walk. After 1½ hours he appeared normal.

Subject No. 3.—A healthy Zebu bull, to be castrated while anaesthetised. Weight: 4 cwt. 0 qr. 5 lb. The technique was as before.

Owing to the fact that this bull struggled during the course of injection, the adapter became disconnected and some of the solution was lost. This rendered accurate measurement impossible, so that insufficient drug was injected and the animal reached a state of medium narcosis only.

In this state he was trussed and castrated by means of the Burdizzo instrument and rose to his feet within 15 minutes.

Subject No. 4.—A healthy Zebu bull, also for castration. Weight: 4 cwt. 0 qr. 22 lb.

Administration proceeded smoothly in the following manner: 50 c.c. injected slowly, followed by a pause of one minute. A further 50 c.c., another pause. This routine was followed until 250 c.c. of solution had been injected and then a little more was allowed to run in very slowly until the bull showed signs of anaesthesia but still maintained a vigorous corneal reflex, and then administration, which had occupied six minutes, was stopped.

Complete medium to deep surgical anaesthesia supervened and lasted for about 35 minutes, during which time the bull was castrated by means of the Burdizzo instrument.

After 35 minutes the anaesthesia appeared to lighten until, 70 minutes after its onset, the animal stood on his feet and commenced to walk about.

270 c.c. in all were injected.

Subject No. 5.—A four-year-old British Friesian bull, which had been suffering for several months with a chronic sinus of the foreleg. Weight: 8 cwt. 3 qr. 10 lb.

Anaesthesia was induced as in the foregoing cases, the computed dose being in the region of 60 grammes of chloral hydrate, *i.e.*, 600 c.c. of 10 per cent. solution.

100 c.c. were run in slowly and a one-minute pause followed. A further 100 c.c. were run in and another pause observed. Again, another 100 c.c. were run in and the clip closed.

During the pause following the last injection the animal sagged and was allowed to go down. No more solution was run in for two minutes and then it was noted that anaesthesia had supervened. Only 300 c.c. (*i.e.*, half the computed dose) had been given.

Steady respirations were maintained and the trocar was left in the vein with the clip closed as a precaution against too rapid lightening.

The bull was then fixed in position for the operation, which was carried out as rapidly as possible, being completed in just under 25 minutes.

At the completion of suturing, the bull showed signs of recovery and moved his foot reflexly on the introduction of the suture needle.

The site was then bound by means of a bandage and cotton wool, in order to protect it from flies, and when this was completed the bull assumed the sternal position and a minute or so later rose to his feet. Although staggering a little, he was able, after 15 minutes more, to walk back to his paddock and shortly afterwards commenced to graze.

Anaesthesia lasted almost exactly 30 minutes.

DISCUSSION

Subject No. 1.—In this case the injection took two minutes and the amount injected was 200 c.c. The rate of injection was too rapid, and thus the dose administered was deemed to be excessive, alarming symptoms of respiratory collapse being produced and anaesthesia of very long duration brought about.

The quantity administered was at the rate of 8 grammes per cwt. body weight (80 c.c. of 10 per cent. solution).

Subject No. 2.—Deep narcosis was obtained by administration of 120 c.c. of 10 per cent. solution of chloral hydrate, *i.e.*, at the rate of 6·8 grammes per cwt. (68 c.c. of 10 per cent. solution). This proved insufficient for the inducement of surgical anaesthesia.

Subject No. 3.—Unsatisfactory, owing to loss of some solution when the adapter became disconnected.

Subject No. 4.—270 c.c. of solution were administered in six minutes. The dosage proved to be at the rate of 6·36 grammes per cwt. and satisfactory anaesthesia was obtained.

Subject No. 5.—Very satisfactory anaesthesia was obtained by the administration of 300 c.c. of 10 per cent. solution of chloral hydrate. Just over 4½ minutes were occupied by the administration. The dosage was at the rate of 3·43 grammes per cwt. This was surprisingly low, and no doubt the cachectic condition of the animal contributed in some degree to this result.

In no case were any untoward sequelae noted up to one month after administration.

Conclusions

The general conclusion reached from this short series of experiments is that satisfactory and safe anaesthesia can be induced in the bovine subject by the intravenous administration of chloral hydrate.

From the figures shown in the above discussion, it seems that computation of a satisfactory dose from the live-weight of the animal is virtually impossible. We have seen from the above results that in one case a dose of 6·36 grammes per cwt. gave satisfactory anaesthesia while one of 6·8 grammes per cwt. failed to anaesthetise the subject.

The figures given supply a basis for the preparation of solution for inducement of anaesthesia, but care must be taken to ensure that an excess of chloral hydrate is prepared.

The factor of paramount importance appears to be the method and rate of injection. It is essential that this be carried out slowly and that assessment of narcosis and anaesthesia be made as injection proceeds.

The standing position is advised as it gives valuable aid in this assessment and need not cause trouble in the technique if the animal is supported on both sides until the required state of anaesthesia is almost reached.

In the above experiments, support on one side was provided by a tubular metal fence and on the other by one or two men, standing close into the flanks and hips of the subject.

My thanks are due to the Director of Veterinary Services, Tanganyika Territory, for permission to publish this account.

Passing the Uterine Catheter

C. M. EDWARDS, B.V.SC., M.R.C.V.S.

Llandyssul, Cards.

The following technique has been found to be useful in maiden heifers, where it is impossible to insert the hand into the vagina, and where the use of a very fine catheter is undesirable owing to the risk of puncturing the uterus. In adult cattle it makes the use of vulsellum forceps unnecessary.

With the animal properly restrained, the catheter is held in the right hand, and introduced into the vagina, keeping close to the upper commissure of the vulva. The left hand is placed in the rectum and guides the instrument along the roof of the vagina towards the external opening of the cervical canal. The whole cervix is grasped in the palm of the left hand, while the free hand manipulates the catheter into the cervical canal. It usually travels the first few centimetres with comparative ease, but the last few of the backwardly directed folds may cause a formidable obstruction. This is especially so in the case of a tightly contracted cervix, and in the maiden heifer, where the genital organs are small.

When such an obstruction is encountered, the external os is tightly clasped round the stem of the catheter by the left hand, so as to convert the interior of the cervix into a "closed chamber." A small quantity of the iodine solution to be injected is now forced into this "chamber," so that the pressure of the fluid inside dilates the distal portion of the canal.

After this, the catheter can be freely passed into the uterus, and can be guided into each horn by the hand in the rectum.

The volume of iodine solution injected into the "chamber" is best judged by the operator as that quantity which will cause the cervix to bulge slightly.

Weekly Wisdom

"*The barriers of convention, which ought to be slender and occasional, are of all the most inveterate and impregnable. Of such have been the barriers devised by mediaeval perversities which, to its grievous injury, have split up medicine into fractions. As physic was divorced from surgery and mind from body, so the diseases of animals and plants were separated from these of mankind. The folly of the division of the medicine of the hand from the medicine of the bottle has now become so glaring that our next festival may be in the blowing up of this rampart; indeed, the gynaecologists have exploded their end of it already. But it is a big business to transform a mediaeval castle, with its baileys, barbicans and keap, into a modern domain.*"—Sir Clifford Allbutt, 1924. President's introductory address at the inaugural meeting of the Comparative Section of the Royal Society of Medicine.

CLINICAL COMMUNICATION

Observations on the Use of Stilboestrol Dipropionate

L. GUY ANDERSON and R. R. BUGG
Aylesbury, Bucks

Case I.—*Subjects.*—Six pedigree Shorthorn heifers, about 18 to 24 months old.

All these were found to be anoestrous with small, hard, inactive ovaries.

Fifteen milligrammes stilboestrol were injected intramuscularly into each of them. All came into oestrus and accepted the bull within 48 hours.

On examination after seven weeks, it was found that none of them was pregnant. Five of the six were again anoestrous, but a corpus luteum was found in the sixth. The oestral cycle had evidently returned in this case, but she was the oldest of the group, and the best conditioned.

Case II.—*Subject.*—Pedigree Jersey heifer, aged 30 months. Reported to be long overdue for calving.

On examination it was found that the animal showed some mammary development which had not changed after the first four or five months; a small foetus was palpated in the right horn of the uterus. The vulva was small and the cervix completely closed.

She had been pregnant about 350 days. Diagnosis of mummified half-term foetus was made; 25 milligrammes of stilboestrol were injected intramuscularly, and the animal examined daily. No change had occurred after four days, so a second similar dose was given. Three days later a third dose of 30 milligrammes was given.

No change whatever could be found a week after this. After an interval of two weeks, three further injections of stilboestrol were given—50 milligrammes, 75 milligrammes and 100 milligrammes respectively at three-day intervals. No change was noted in cervix or uterus, but there was slight mammary activity.

Case III.—*Subject.*—Guernsey heifer, 2 years old. She was found on examination to be anoestrous. Fifteen milligrammes stilboestrol were injected intramuscularly, and oestrus occurred within 24 hours. The heifer was served, and on examination ten days later a good corpus luteum was found in the right ovary.

The heifer returned to service six weeks later, and on examination after eight days was found to be normal with a corpus luteum present in the right ovary.

Case IV.—*Subjects.*—Three Friesian cows affected with pyometra.

(*a*) Previous treatment of this animal had comprised three uterine irrigations with iodine solution. No marked improvement was observed. The uterus was irrigated with 24 oz. of a 5 per cent. solution of M.371 (kindly supplied by Dr. A. D. McEwen). Twenty-five milligrammes stilboestrol were injected intramuscularly one week later; the animal came into oestrus and is now apparently normal.

(*b*) This animal had previously been treated with three uterine irrigations of iodine solution. It was decided to use the animal as a control against (i) to assess the value of M.371, and this animal was given a further uterine irrigation with iodine and injected after one week with 25 milligrammes stilboestrol. Apparent oestrus resulted, but no marked improvement in the condition of the uterus has been observed and pyometra persists.

(*c*) This case of pyometra is of very long standing; numerous uterine irrigations with iodine and two with M.371 have not improved the condition. Forty milligrammes stilboestrol had no effect, and failed to produce a noticeable discharge of pus.

Case V.—*Subjects.*—Two Shorthorn cows attended at parturition.

Retention of the foetal membranes was anticipated, and 20 milligrammes stilboestrol were administered to each cow. Neither cow had cleansed by the third day, and the membranes were removed manually. The membranes were found to be still very firmly adherent to the maternal cotyledons. In each case the cervix was found to be widely dilated, and the uterine horns so contracted that each time the cow strained the impression was gained that prolapse of the uterus was imminent. No such mishap occurred, however, and both cows made good recoveries.

A new Association has been formed in the north-east of Scotland, with headquarters in Aberdeen, to deal with pests on livestock. Experiments will be chiefly devoted to the eradication of ticks among sheep, this pest having caused serious losses in badly infected areas. Lord Glentanar is first Chairman of the Association.—*Farmer and Stock-breeder.*

ABSTRACTS

[THE RELATION OF TAIL LENGTH TO THE INCIDENCE OF BLOWFLY STRIKE OF THE BREECH OF MERINO SHEEP. Riches, J. H. (1941.) *J. Council Sci. and Industr. Res.* (Australia). **14**. 88-93.]

Describes the results of two experiments to determine the effect of tail length on the incidence of breech strike and tail strike on Merino lambs. In the first experiment three groups of ewe lambs of about 128 each were treated as follows: (*a*) Long tails, docked to leave a stump of 4 in. long; (*b*) Medium tails, docked at about the second tail joint; (*c*) Short tails, docked level with the buttocks. The lambs were ear-tagged and individual strike records were kept. During the period when the majority of strikes occurred the percentage incidence of strikes in these three groups was: long tails 32·2, medium tails 55·9 and short tails 61·0. In the second experiment a similar procedure was followed, except that a group of undocked lambs was included. The preliminary results confirmed those obtained earlier, *viz.*, long tails 8·4, medium tails 28·0, short tails 35·6. The percentage of strikes in the undocked lambs was 12·1, and the author concludes that there appears to be little advantage in leaving tails longer than 4 in. The observations are being continued.

W. L. S.

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[MICROSCOPIC EXAMINATION OF INCUBATED COMPOSITE MILK SAMPLES—A RAPID AND EFFICIENT METHOD FOR DETECTING STREPTOCOCCUS AND STAPHYLOCOCCUS INFECTION OF THE BOVINE UDDER. Kleckner, A. L. (1942.) *University of Pennsylvania Bulletin.* **42**. 1-13.]

It is suggested that a useful test for the general practitioner is to incubate bulk milk samples from each cow and then examine microscopically. Long-chained steptococci are practically diagnostic for contagious mastitis, 1,068 known negative samples giving only 0·7 per cent. false positives and 1,076 samples of mixed positive and negative cows giving 3·7 per cent. false negatives. Staphylococcal mastitis can also be detected this way, though more practice is necessary to enable the pathogens to be differentiated from the saprophytes.

P. S. W.

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[A SIMPLE AND RAPID METHOD OF STAINING MALARIAL PARASITES IN THICK BLOOD SMEARS. Field, J. W. (1940.) *Trans. Roy. Soc. Med. and Trop. Hyg.* **34**. 195-202.]

The formula recommended is: brilliant cresyl blue 1·0 g., disodium hydrogen phosphate (anhydrous) 1·0 g., potassium dihydrogen phosphate (anhydrous) 1·25 g., distilled water 100 c.c.

First dissolve the phosphates; they give a solution approximately isotonic wth blood serum at *p*H 6·6 (the optimal *p*H for the method is 6·6-7·0). Then add the stain, grinding in a mortar to help solution. Filter and use, refiltering later if any scum forms and causes trouble by deposition on the smears.

An alternative but less brilliant similar stain is: methylene blue 0·4 g., eosin 0·1 g., isotonic buffer as above 100 c.c. Dissolve the methylene blue in 80 c.c. of the buffer and the eosin in 40 c.c. of it; then add the eosin to the methylene blue. Filter the whole and use, refiltering if any scum forms.

For either stain make films not thicker than 50 microns (the hands of a watch should be dimly visible through them when they are held near to the watch face). Dry the film rapidly by waving in the air or in a hot air current or pass it rapidly through a flame for one second, never letting the slide get so hot that it cannot be held against the back of the hand. This light heat fixation may damage young rings, but it renders crescentic gametocytes remarkably clear. Then dip the smear in a jar of the stain for one second only; this time must not be exceeded. Rinse for five seconds by *gently* waving in tap water. Dry vertically in a rack; the haemoglobin drains away leaving four zones: (1) the uppermost, from which most haemoglobin has drained, the best zone for showing minute forms, *e.g.*, young rings; (2) the zone next below in which enough haemoglobin remains to give a smooth creamy yellow background against which the parasites are vivid blue; (3) next below a zone in which definition is not clear and only the white blood cells and the larger forms of the parasites are seen; (4) the lowermost zone in which white blood cells and parasites are often beautifully contrasted against a smooth yellow ground. By this method diagnosis can be made in 1½ minutes from making the film.

The author's figures indicate that the concentration of parasites in thick films is 16 times that in ordinary thin films. Drawbacks are that young rings of *P. falciparum* stain pale and are minute; young *P. vivax* trophozoites, sometimes found in immature erythrocytes, may be difficult to identify; ring forms may be collapsed;

the chromatin dot in trophozoites looks smaller than it does with Giemsa and is not of a different colour, and schizogony is less evident than it is with Giemsa. The experiments resulting in the method were suggested by the methods of Pampana and Simons, which are also described.

(In a communication to the Editor, Peck reports that he has found the method useful in Somaliland for picking out trypanosomes.)

G. L.

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[NEUROLYMPHOMATOSIS OF FOWLS. Blakemore *et al.* (1940.) *Proc. Roy. Soc. Med.* **34**. 109-116.]

The contributors to this discussion indicate that fowl paralysis is inoculable and is caused by a filtrable virus. Failure to reproduce the disease experimentally, as frequently occurred in early investigations, is believed due to the existence of strains of poultry exhibiting marked degrees of insusceptibility, to the insusceptibility of fowls generally when over one year old and possibly to the fact that fowl paralysis, as occurring naturally, is usually a chronic disease and material selected for transmission experiment may contain little, if any, infective potency.

In transmission experiments an acute form of disease showing little resemblance to natural fowl paralysis was produced in chickens; when death occurred approximately ten days after inoculation focal necrosis of the liver and myocardium was observed. These lesions, without the presence of infiltrating lymphocytes, were regarded as the early tissue changes which occur in fowl paralysis. Similar necroses were observed in the same organs in natural cases selected at a sufficiently early stage; moreover, in passage chicks which survived for periods longer than ten days infiltrations of lymphocytes and the occurrence of interstitial changes characteristic of natural fowl paralysis were readily demonstrated.

Developing chick embryos were found susceptible providing they were obtained from non-resistant strains of poultry.

The infective agent in liver tissue was found resistant to drying for a period of at least 135 days. Protective antibodies were not detected in the sera of recovered birds nor did formalinised suspensions of infective liver afford protection against a test dose of the active agent given one month later.

D. R. W.

THE NATIONAL HORSE ASSOCIATION

At a recent meeting of Council of the above Association, the balance sheet and report for the year were authorised for issue to members, indicating that the total paid-up membership was 1,218, which compared with 1,521 at the commencement of the present war. The Council considered that this figure was much better than might have been expected, and they were indeed grateful for the continued support of so many members.

The Council learned with pleasure from the National Veterinary Medical Association that the investigation of grass sickness was receiving considerable attention from members of the veterinary profession, and they would be very glad to be kept advised of what was taking place, as it was a disease causing owners many deaths among horses.

Various members submitted letters received from different stud owners regarding instructions issued to them by certain County War Agricultural Executive Committees which would seriously interfere with the breeding of horses. Three cases in particular were reported where breeders had received peremptory orders from local committees to reduce their studs and to stop breeding operations. Representatives of various breeds spoke in the discussion, and it was resolved to draw the attention of the Minister of Agriculture to these facts, and to state that the Council were very gravely concerned at the somewhat imprudent action of certain of the War Agricultural Executive Committees.

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Included in a report of the Milk Committee submitted for the approval of the War Committee of the N.F.U. and Chamber of Agriculture for Scotland, is a recommendation that approach should be made to the Department of Health to have the administration of the dairy by-laws taken out of the hands of the local authorities and placed under the control of the Ministry of Agriculture, who are at present responsible for the operation throughout Great Britain of the various measures laid down in the Diseases of Animals Acts. A memorandum in support of this suggestion, which is made in the interests of uniformity, is in course of preparation.

A.R.P. for Animals

N.A.R.P.A.C. Services in Action: a Review

In view of the fact that, as intimated in our last issue, the Farm Livestock Emergency Service about to be instituted will, in the first instance, take over and reorganise on an official basis the service created by the Rural Areas Committee of the National A.R.P. Animals Committee, it is felt that publication of a summarised review of the services rendered by those assisting the Rural Areas Committee will be of value and interest. At the same time, the opportunity is taken to report in brief on the N.A.R.P.A.C. service for the urban areas.

The following information relative to both these aspects of N.A.R.P.A.C. activity is extracted from a recent report issued by the Committee of Control and it reveals some of the reasons why the Government has found it expedient to establish the Farm Livestock Emergency Service.

N.A.R.P.A.C. Service for Farm Livestock

The Director of Veterinary Services introduces this report with the statement that after the first few months of the war, during which the National A.R.P. Animals Committee was developing an A.R.P. service for animals in towns, the need for some similar service in the country to handle injured farmstock became ever more apparent. Accordingly it was decided to organise a service within a limited area and see whether this service would have much chance of success on a voluntary basis. In consultation with Professor T. Dalling, M.A., M.R.C.V.S., of the Institute of Animal Pathology, Cambridge, and the N.A.R.P.A.C. Area Veterinary Controller for the Eastern Counties, it was decided to begin with these counties. Meetings, at which the object of the service was outlined, were held of veterinary surgeons and farmers and the area was divided into divisions, each with at least one veterinary surgeon and a personnel skilled in the handling of farmstock.

The report proceeds: "It was soon evident that such a service, provided it were properly organised and co-ordinated with the A.R.P. and Police services, could be of great assistance to the farming community, and after three months' trial, during which it was extended throughout the Eastern counties, the main National A.R.P. Animals Committee formed a 'Rural Areas Committee' and charged this with the extension of the service throughout the country. Although the service has never been completed, owing to certain doubts which arose concerning its future, it now covers practically all districts in England and a fair proportion of Wales and Scotland. It has been developed in close co-operation with the National Farmers' Union and its branches."

The following are given as the objects of the service:—

1. To ensure that injured farm animals receive prompt and expert treatment so that their productivity is not unnecessarily lost to the country.
2. To arrange for livestock owners to receive immediately expert advice on the advisability of killing seriously injured animals.
3. To salvage, for food purposes, as much as possible of the carcases of killed or slaughtered animals.
4. To assist owners in disposing of carcases of animals unfit for food purposes.
5. To protect the public against damage from injured or frenzied animals at large.
6. To cope with gas contaminated animals and carcases.

In regard to personnel, it is stated that this includes: about 1,500 veterinary surgeons, together with approximately 8,000 lay assistants functioning variously as animal stewards, as members of a salvage service (comprising county slaughterhouse agents of the Ministry of Food, the managers of the recognised slaughterhouses and their skilled personnel), and as animal service helpers, with local butchers, slaughtermen and transport personnel.

The report proceeds to detail the organisation of the service and the duties of the professional and lay personnel, with both of which our readers will be familiar. It is stated that "the core of the service is the practising veterinary surgeon and those of his professional colleagues who can assist him. The veterinary officers of the Ministry of Agriculture and Fisheries, unless engaged upon more important departmental work at the time, assist mobile units of the Committee in every way possible."

The Service in Action

Speaking now of the Service in Action, the Director says: "The efficiency of the service naturally depended upon the rapidity of notification of the existence of casualties to the veterinary officer, salvage officer or parish animal steward. Generally speaking, therefore, it depended upon the speed with which the affected farmer reported the incident, and hence to ensure this it was imperative that farmers were fully instructed beforehand as

to the necessity for such quick action and how to take it. In the early days of air raids many cattle, sheep and other animals were lost completely owing to the failure of the farmer to notify his trouble sufficiently early. In other instances the serious results of the lack of action on the part of the farmer were avoided by the efficient action of the parish animal steward. At other times losses occurred for other reasons concerned with the organisation itself, *viz.*, a veterinary officer or a salvage officer did not take action speedily enough, but taken by and large the service may be said to have functioned exceedingly well under the most difficult circumstances, usually during black-out hours.

"*Casualties.*—Reports have been sent in to headquarters of over 5,500 casualties among animals of economic importance, but it is known that these reports only cover a proportion of the actual casualties dealt with by the service, as many of our personnel reported direct to the Ministry of Food and others for one reason or another made no report at all. Altogether casualties have been reported from 35 out of the 39 counties in England, 6 counties in Wales and 7 counties in Scotland. An analysis of these reports is, however, helpful in forming an idea of the value of the service, not only to the farmer, but also to the country.

"Table I gives the numbers of animal casualties, excluding dogs and cats, dealt with, and these are classified according to the species concerned and the effectiveness of the assistance rendered. From Table II, which is based on the figures of Table I, it is seen that 32 per cent. were killed outright and past assistance: the remaining 68 per cent. received skilled attention from N.A.R.P.A.C. personnel; 17·5 per cent. were treated for injuries and brought back to productivity; 29 per cent. were slaughtered and salvaged for human consumption; and 21·5 per cent., although unfit for salvage, were slaughtered on the grounds of humanity or of public safety.

TABLE I
Classification and number of casualties reported

	Horses	Cattle	Sheep	Pigs	Poultry	Total	Total excluding poultry
Total	780	2,132	1,377	750	506	5,545	5,039
Killed outright ..	216	524	757	216	409	2,502	2,093
No. which received attention	564	1,608	620	534	97	3,043	2,946
Treated	282	520	57	25	—	884	884
Salvaged	45	724	297	393	30	1,489	1,459
Destroyed	237	364	266	116	67	1,050	983

TABLE II
Further analysis of casualties reported in Table I, excluding poultry

Percentage of casualties treated ..	17·5	per cent.	
" " salvaged ..	29	"	
" " destroyed ..	21·5	"	
Therefore " " which received attention ..	68	"	

TABLE III
Analysis of monetary values of casualties, based upon the conservative average values cited (in sterling)

Average value live animal ..	Horses 50	Cattle 50	Sheep 4½	Pigs 6	Poultry ½	Total —
Average value carcase ..	5	20	4½	6	7s. 6d.	—
Total value of casualties reported	39,000	106,600	6,197	4,500	253	156,550
Saving through treatment ..	14,100	26,000	256½	150	—	40,506½
Saving through salvage ..	225	14,480	1,336½	2,358	11	18,410½
Total saving	14,325	40,480	1,593	2,508	11	58,917

"If all these animal casualties had died the monetary loss to the nation would have been £156,550 sterling, even when the calculations are based upon low average figures (*vide* Table III). The saving as the result of treatment was £40,506½ and as the result of salvage £18,410½. The total sum which might otherwise have had to be paid out as compensation was thus £58,917. This is 37 per cent. of the value of all the casualties reported.

"It is evident from a study of these figures," the Director continues, in this connection, "that the Casualty Report service of the organisation is capable of giving great assistance to the body responsible for verifying that reported casualties were actually due to enemy action and for assessing the compensation arising from war damage to farmstock.

"The nature of the casualties reported varied considerably and included a variety of conditions varying from superficial lacerations to the complete disruption of the body into small parts. Some of the reported conditions were superficial wounds, deep penetrating wounds due to shrapnel or bomb splinters, etc., perforated thorax, ruptured abdomen, disembowelling, perforated bowel, internal haemorrhage, pneumonia, peritonitis, spinal injury, paralysis, concussion, sprains, fractured nasal bones, jaws, limbs, shoulders, hips, etc., cardiac failure, burns, crushing, burial under debris, drowning, etc., etc."

The Director concludes: "Successful as the service has been, it is certain that it would have been even more successful had N.A.R.P.A.C. been given proper Government recognition and had its voluntary personnel felt that the Government thoroughly approved of their efforts. The luke-warm recognition afforded the service did not facilitate the establishment of effective co-operation with the Police, the A.R.P. service, or with the Ministry of Food. Furthermore, the uncertainty as to whether those engaged in this highly emergency service—in that delay spelt disaster—were able to claim State compensation for service injuries, greatly aggravated the difficulties of maintaining an enthusiastic personnel.

"The small Headquarters staff consisting of two veterinary surgeons and clerical assistants did much to facilitate local organisation by addressing meetings of veterinary surgeons, farmers and the public, consulting officers of collateral services, and issuing a small amount of equipment, many advisory brochures and leaflets and identity cards, car badges and name plates for gates, but their efforts would undoubtedly have failed had they not received the unstinted service of the majority of members of the veterinary profession and of a large body of farmers, farm workers and butchers."

The Service for Urban Areas

In this report there is recalled the prompt voluntary mobilisation of the members of the profession resident in the towns concerned, at the call of the Ministry of Home Security, to organise an emergency service for dealing with animals in the so-called "evacuation areas"—from which small beginning has been organised an A.R.P. Animals Service in towns throughout the country comprising in its personnel over 1,500 veterinary surgeons and approximately 40,000 animal guards.

The respective duties of the veterinary officers of the staffs of the animal welfare societies and of the personnel of the immense National Animal Guard organisation are outlined, together with the operative procedure for their control and co-ordination.

In a section devoted to the financial maintenance of N.A.R.P.A.C. services it is stated that these have been organised on a voluntary basis from the commencement, and that it will be seen from the financial statement appended to the report that "the cost of the services to the Committee has amounted to a little over £74,000, which sum has been defrayed by voluntary collections received from the public amounting to nearly £35,000 and by contributions from the Animal Welfare Societies of something over £39,000, the bulk of which came from two societies. Should the war continue, it is unlikely that these organisations can maintain contributions of such magnitude to a national service such as N.A.R.P.A.C., as it will become more and more difficult to finance even their own activities."

The Urban Service in Action

In the introduction to this section it is pointed out that the multiplicity of Civil Defence personnel in towns renders essential preliminary effort to secure effective liaison with the official services if the unofficial or semi-official services, such as N.A.R.P.A.C., are to function with any degree of efficiency under emergency conditions; moreover, the rank-and-file must be kept thoroughly informed of arrangements. We will let the report speak dramatically (as it does) for itself in respect of the nature of the work performed, as follows:—

"In two of our larger towns the municipal abattoirs and lairages were bombed and hundreds of animals were led to safety and saved. In another instance the Civil Defence services decreed that nothing could be alive beneath a demolished building, but the A.R.P. Animals personnel, knowing that the building had housed 120 sheep, proceeded to remove the debris and several hours later their efforts were rewarded by the rescue of every animal alive.

"In most large towns horses which had been severely wounded were humanely slaughtered to release them from suffering or to safeguard the public from their frenzied movements. In view of the fact that a large proportion of the bigger stables in London were hit by H.E.s or incendiary bombs during the heavy raids, the number of horses lost was surprisingly few, and much of the credit for this must be given to the educational work and the active assistance given by N.A.R.P.A.C.

"In so far as household animals are concerned, comparatively few have needed treatment, but nearly half a million have been collected from blitzed areas following heavy raids. That some such rescue service is important has been clearly demonstrated upon occasion when no service was immediately available. For

example, in the early days of the raids on London vast numbers of dogs and cats were rendered homeless in the Silvertown area, which in a few days became dangerous to human beings because of starving packs of dogs taking possession of evacuated houses. The situation was only got in hand after various animal welfare societies co-operating with N.A.R.P.A.C. drafted skilled personnel to the area.

"Under the reorganised scheme animals are rounded up soon after raids, by the rescue squads of Animal Guards, a number of cats being left behind in warehouses in large derelict areas in order to keep down vermin. These stray animals are taken to detention points and rest homes and subsequently returned whenever possible to their owners.

"Although it is not possible to state the total number of straying household animals handled during air raid periods by the A.R.P. Animal Service, as all such handlings were not reported, yet the magnitude of the problem is clearly demonstrated by the fact that 121,300 strays were dealt with in seven of the larger towns subjected to heavy raids (see Table IV).

TABLE IV

Straying animals collected by N.A.R.P.A.C. during and after air raids:—

Town	*No. of Animals*
London	102,600
Birmingham	6,100
Manchester	4,600
Coventry	2,400
Liverpool	2,400
Plymouth	2,100
Swansea	1,100
Total ...	121,300

"Although no reliable records are available it is estimated that over the whole country the organisation has handled at least three times the number, or approximately 400,000."

The report concludes: "The rescue and registration service has been of considerable assistance to the police and owners of small animals during periods free from air raids, when approximately 3,000 lost animals are handled each week, the majority of which are actually returned to their owners. Already over 200,000 cats and dogs have been dealt with during the periods of inactivity. Thus the N.A.R.P.A.C. Service has already assisted over 600,000 household animals. It would not be difficult to imagine what might have been the situation if cats and dogs were without this Service. It is evident that the service rendered is of considerable importance to the community and consequently everything should be done, as far as possible, to improve its efficiency. It is believed that this efficiency could be materially enhanced if an official liaison were established between the Civil Defence Services, the Police and the N.A.R.P.A.C. Service.

ALLIED POST-WAR RELIEF COMMITTEE AND THE LIVESTOCK POSITION

According to information available to the Allied Post-War Relief Committee, it is believed (says *The Farmer and Stock-breeder*) that the herds of livestock in Europe have been reduced, in consequence of German occupation, by from 25 to 50 per cent.

Among the methods considered by the Committee for the purpose of restoring the herds after the war is artificial insemination. Although this cannot increase the number of young animals beyond those normally produced from the breeding females, it can increase the amount of milk and other products by increasing the efficiency of the young animals produced. It is considered likely that a poor cow, if bred by artificial insemination to a good bull, would produce a heifer with a 30 per cent. higher milk yield. In some cases local bulls or other male animals could be used, in others it would be necessary to consider imports from Great Britain, Canada or the U.S.A. Any plans for maximum livestock breeding mean the suspension of the slaughter of female stock, and this in turn involves consideration of alternative sources of meat. Rebuilding of herds calls for a careful study of the fodder position, the possibility of importing feeding-stuffs, especially oil-cake, and the rapidity with which pasture, much of it ploughed up by the Nazis in their attempt to increase supplies of human food, can be restored.

Statements have now been submitted by all the Allied countries showing their pre-war livestock and the breeds most in use. These vary not only from country to country, but from district to district within the country.

REVIEW

[**PROGRAMME FOR AGRICULTURE.** Lord Addison, Sir Ralph Glyn, Viscount Lymington, A. J. Hosier, A. G. Street, Sir Daniel Hall, Capt. Hinckes, Lord Cranworth. Edit. Brian Vesey-Fitzgerald. Foreword by R. S. Hudson. Michael Josephs. (1941.) Pp. 206. 10s. 6d.].

This book is a series of essays on the future of agriculture which appeared in the *Field* during 1940 and 1941. The principal essay is by Lord Addison, but there is such general unanimity amongst the writers that the essays can be reviewed as a whole. A. J. Hosier says that he has never read so much common sense about agriculture from a politician, and Street that no true countryman will find fault with Addison's retrospect and few with his main contentions.

Our last post-war agricultural "policy" was entirely inadequate and we continued with a happy-go-lucky system when it was obviously leading to ruin. To prevent a repetition of this fatal error we must think and plan about the future of agriculture now and establish institutions which with modification will continue to function after the war.

Before the war three-quarters of the total agricultural sales consisted of livestock or livestock products and the chief crop was grass, but under the "system" of *laissez faire* more than half the agricultural land of Great Britain was under-farmed and there is now a great need for an extensive policy of rural restoration. After this war we shall have to develop a composite system of farming: arable-grass-livestock largely on the lines advocated by Sir George Stapledon. Farming practice and the size of farms will have to vary greatly, but it is felt that in many areas a change over to large-scale mechanical farming would be advantageous. Contrary to general belief it has been shown that this can lead to greatly increased production, an increase in labour employed, the head of livestock carried, and the average wage.

The difference between the wholesale and retail price, particularly of milk and vegetables, is deemed to be a national disgrace; many people employed in the distributive trades would be better employed in agriculture and the vested interests which have grown up should no longer be allowed to profit at the expense of both the farmer and consumer. The fundamental defect is that both farmers and consumers are unorganised masses of individuals dealing with highly organised groups. In her brilliant investigation of the "sweating system" at the end of the 19th century Beatrice Webb concluded that the chief cause of sweating was unrestricted competition amongst the persons "sweated." In some countries farmers have long realised the necessity for co-operative marketing and it is gradually being realised in Great Britain and the U.S.A.

Owing to death duties, the freedom of cropping and the increased complexity of research, the landowner is no longer able to carry out his traditional functions or to supply the necessary capital, and particularly in research, the State has already begun to take over his duties.

It is vital to agriculture that, apart from drainage, £250,000,000 should be spent on capital equipment, but although £450,000,000 has been lost in foreign speculation in South America alone, home agriculture has been starved of capital for over a generation.

There is a general consensus of opinion that without some form of land nationalisation the country would not consent to the expenditure on land improvement which is vitally necessary. A. G. Street says "the only possible landlord for our countryside is the State," and Hosier "it seems obvious that the necessary resources can be provided only by the State, and that, consequently, the land must become the property of the State." The Central Landowners' Association has for years advocated a *permanent* National Agricultural Commission as far as possible removed from party politics.

It is emphasised, however, that changes should be gradual and there is some disquiet as to how the land will be administered. The State as a landowner would have to leave a great deal to the discretion and initiative of its local officers, but this would be contrary to the training and traditions of the Civil Service with its blind devotion to simple rules and adherence to fixed formulae. It is felt, therefore, that some body, responsible for nutrition and the development of agriculture, should be formed which is not under the Ministry of Agriculture, for this is an organisation staffed by Civil Servants trained to administer regulations and not to direct business operations.

At present there is little scope in farming for men with a scientific training in agricultural methods and business organisation if they lack capital, and although there is a need for the best type of business leader in agriculture keen men have taken it for granted that there is no opening for them on the land. (The reader will find a definition of the "best type of business leader" in

"Dynamic Adminstration," The Collected Papers of Mary Parker Follett. Metcalf & Urwick. Management Publications Trust, Ltd. 1941. This book deals with the problem of human relationships both individually and in the mass—a problem which is as important in the veterinary as in every other field of endeavour.) Much more vocational as opposed to "arts" training is required in our country schools and the prejudice against manual labour which has persisted since classical times must be overcome. In many areas 80 per cent. of the houses should be condemned and in order to attract the right type of worker to agriculture rural housing will have to be greatly improved.

It is felt that the scheme, which has only been very briefly sketched in this review, would do much to rehabilitate our countryside, produce the food which may still be difficult to import long after the war is over and provide opportunities for new types of men in agricultural endeavour. The great problem is to find a method of developing large-scale organisations in which the exercise of individual initiative is still possible.

REPORT

[**MADRAS.** Administration Report of the Civil Veterinary Department, 1939-40.]

The Annual Administration Report of the Madras Civil Veterinary Department for the year 1939-40 is a very interesting indication of the development which is taking place in India in veterinary and animal husbandry work. Livestock improvement and animal husbandry in Madras province have recently come under the control of the Director of Veterinary Services, and systematic disease investigation has been in operation for several years under a grant from the Imperial Council of Agricultural Research, while the standard of veterinary education is now being considerably raised. The association of animal husbandry with the other work of the veterinary staff amongst livestock throughout the province facilitates the extensive livestock improvement measures in the villages which are needed, and it is to be hoped that long continuity of policy, which is essential to satisfactory progress in animal husbandry work, may now be assured.

As regards veterinary education, the previous course of training given at the Madras Veterinary College to veterinary graduates and the B.V.Sc. under the previous regulations were continued, but during the year Government orders were received sanctioning the introduction of a five-year B.V.Sc. degree course to be carried out at the Madras Veterinary College under the Madras University. The establishment of a satisfactory B.V.Sc. course at this college has been under consideration for some years, and marks a considerable advance in the standard of veterinary education in India.

At the Madras College extensive facilities now exist for disease investigation, research, and for the production of biological products; and it is of interest to note that arrangements have been made for the final year degree students to be deputed to the livestock research station at Husur for a six weeks' course of instruction in dairying and livestock work, following their final Diploma examination. This is in accordance with arrangements which were made during recent years for small dairies wherever possible to be maintained at veterinary colleges to provide facilities for practical training.

Refresher courses were also given for veterinary graduates and an examination was held for stockmen trained at outstations. This is another new development arising out of recommendations made at a meeting of the Animal Husbandry wing of the Imperial Council of Agricultural Research to provide extra staff with a view to extending systematic livestock improvement measures in all provinces and the major states of India.

At the college itself, considerable extension of pathological and bacteriological investigation and research is taking place, and museums for instructional purposes are being built up in each section.

Amongst the diseases dealt with the following may be specially mentioned: Johne's disease, several cases of which were detected in material received from Government farms and from touring veterinary assistant surgeons in different areas; pulmonary tuberculosis, which continued to occur in conservancy bullocks of Madras city, and a case of which in an elephant of the Forestry Department was microscopically confirmed. Carcinoma of the horn core and eye continued to be very prevalent and there were 51 positive cases of rabies. Contagious bovine abortion was confirmed in a number of cases in various parts of the province. Blackwater and haemorrhagic septicaemia continued to be prevalent.

In blood examinations the following were some of the most important parasites found in dogs: *Babesia canis, Hepatozoon canis, Babesia gibsoni*; and in cattle, *Theileria mutans*.

In examinations of faeces it appears that ova ankylostomes were most prevalent.

The work of the college is divided into the following sections: (*a*) Pathology, Bacteriology and Parasitology; (*b*) Clinical Laboratory; (*c*) Biology; (*d*) Physiology; (*e*) Chemistry; (*f*) Anatomy; (*g*) Pharmacology; (*h*) Hygiene.

The Serum Institute attached to the college has now been established on a permanent basis and has been moved to new buildings adjoining the college. The following materials are manufactured at this institute: anti-rinderpest serum, anti-haemorrhagic septicaemia serum and vaccine, rinderpest bull virus and goat virus, and rinderpest glycerinated goat spleen tissue vaccine. About 1¼ million doses of rinderpest serum were manufactured during the year.

Owing apparently to higher susceptibility of cattle, and particularly bulls, in the Madras province, it appears that goat spleen tissue vaccine is liable to cause a too severe reaction to make it a suitable product for general use. This finding in Madras is of considerable importance and is at variance with the rapidly increasing use of this product in other provinces, where the cattle, being more constantly exposed to waves of rinderpest infection, are not so highly susceptible as in Madras province, where the annual movement of cattle in droves does not occur to the same extent.

An important observation was made during the year with desiccated goat spleen tissue vaccine, which is now extensively employed in Burma. Tested on buffalo calves, 0·0025 gm. in 1 c.c. of normal saline, immediately on receipt from Burma, and after keeping at room temperature for one to four days, this vaccine produced a mild reaction only, and appeared to confer a satisfactory degree of immunity as judged by subsequent tests with bull virus. Other batches of desiccated spleen tissue vaccine prepared in the institute were tested and in the same dosage produced a mild reaction in buffalo calves which appeared to confer immunity sufficient to withstand a subsequent test with bull virus. It was also shown that this vaccine sets up a mild reaction and confers immunity on adult buffaloes. The size of the dose appears to have little influence on the severity of the reaction. This product appears likely to be a valuable one for field use in India and it is hoped to carry out further extensive trials during the coming year.

During the year research was carried out at the veterinary college laboratory on contagious pleuropneumonia of goats, and under a grant received from the Imperial Council of Agricultural Research, research in the helminthiasis of cattle was continued.

A new system of reporting diseases of sheep and goats was introduced, and is reported to be likely to lead to more attention to the diseases of these animals. The livestock section has now completed its second year since its transfer to the veterinary department, and arrangements have been accepted by Government to organise a Provincial Livestock Improvement Board. The function of this Board is to institute and revise schemes for systematic livestock improvement and for raising funds to finance such work, for which a lump sum has been set aside by Government.

The milk yield of the pure-bred Sindi herd maintained at Husur is steadily improving. In addition, pure herds of Khangyam, Halikar and Ongole breeds are maintained, and a small herd of pure-bred and graded Murrah buffaloes. Flocks of sheep, pigs and poultry are also maintained, and experimental work is proceeding with a view to producing a woolly breed of sheep suitable for the Madras province. A. O.

(*Continued from col.* 1, *page* 254)

Dr. Edith Summerskill: Does not the right hon. and gallant Gentleman think it would be in the interests of the country to prohibit the sale of any unpasteurised milk?

Mrs. Tate: As many people loathe pasteurised milk, can we not have a free choice in the matter?

Mr. Woods: Is it not the case that a good deal of milk at present is wasted because it is not pasteurised, and would it not be a great economy if there could be a further extension of pasteurisation in spite of the difficulties in the way?

Food Supplies: Milk

Mr. David Adams asked the Parliamentary Secretary to the Ministry of Food whether inasmuch as milk referred to in the recent White Paper upon milk policy as of poor keeping quality originates largely from low-grade farms, producing non-designated milk, it is now intended to raise the quality of such milk by improving the low standards of the herds and of the farms concerned?

Mr. T. Williams: I have been asked to reply. If any milk is found, on test, to be of poor keeping quality, steps will be taken to ascertain the cause and to advise the farmer concerned as to what he should do to secure improvement.

QUESTIONS IN PARLIAMENT

Artificial Insemination

Sir J. Lamb asked the Minister of Agriculture whether he has any further statement to make on artificial insemination in view of the widespread desire to launch immediately new schemes of this nature?

Mr. Hudson: I am aware that a number of schemes for artificial insemination have been prepared, or are in contemplation. While I fully appreciate the great potentialities for good of this practice if properly conducted, its possibilities for harm if it is inadequately controlled, or if development takes place on wrong lines, are also considerable. I concur, therefore, in the view held by the Agricultural Improvement Council that any results to be anticipated from an extension of the practice of artificial insemination are important from the point of view of long term policy rather than in relation to their influence on the immediate position. I also share their opinion, reflected in their recommendation for the initiation of two large-scale field trials to be carried out under the general supervision of the supervisory committee recently appointed by the Council, that before its general adoption can be recommended, experience of its practical application under ordinary farming conditions in this country is desirable. As I have already stated, I hope to obtain powers from Parliament enabling me to exercise a proper degree of control, and I have asked the supervisory committee to advise me on this point as a matter of urgency. In the meantime, I consider that no schemes other than the two recommended by the Council, or any that the supervisory committee may subsequently initiate or approve, should be proceeded with.

Colonial Research Advisory Committee

Mr. Creech Jones asked the Under-Secretary of State for the Colonies whether the names of the Colonial Research Advisory Committee can now be made known; and what large pieces of research are in progress or being visualised?

Mr. Harold Macmillan: The members of the Committee will be as follow:—

Lord Hailey, Chairman.
Sir Edward Appleton, Secretary to the Department of Scientific and Industrial Research;
My hon. Friend the Member for Cambridge University (Professor A. V. Hill), Secretary of the Royal Society;
Sir Edward Mellanby, Secretary of the Medical Research Council; and
Dr. W. W. C. Topley, Secretary of the Agricultural Research Council.

As regards the second part of the Question, the war has restricted the amount of major research being carried out; but it will be one of the first tasks of the new Committee to survey the field and to make recommendations for the future.

Milk (Pasteurisation)

Mr. David Adams asked the Parliamentary Secretary to the Ministry of Food whether it is now decided that all milk for human consumption passing through milk depots will be pasteurised before being supplied to the public; is it intended to pasteurise all designated grades of milk below T.T. standard, as from records of medical officers of health much dangerous and unsatisfactory milk is being delivered under other designations; and whether milk delivered direct from producers to wholesalers will be pasteurised also?

The Parliamentary Secretary to the Ministry of Food (Major Lloyd George): As stated in Paragraph 6 (F) of the Memorandum on Milk Policy which was presented last week, milk which passes through depots will, so far as possible, be pasteurised before it leaves the depot or be brine cooled and delivered to a wholesaler or retailer who can pasteurise the milk before supplying it to the public. As regards the second and third parts of the Question, pasteurisation will be arranged to the maximum extent compatible with the need for economy in transport.

Mr. Adams: Have not the Government declared themselves for years past in favour of pasteurising all milk in the interests of public health? Cannot this now be achieved totally for the whole country?

Major Lloyd George: Practically all the milk going to depots is pasteurised. The difficulty arises with the small producer-retailer who sells direct. Every possible effort is made to pasteurise it, but some of the small people have not the machinery, and, with the movement of milk controlled as it is, it is very difficult in war-time. But in the case of milk going to the depots practically 100 per cent. is pasteurised.

Viscountess Astor: Would it not be wise to pasteurise all Grade A milk?

(*Concluded at foot of col. 2, page 253*)

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 25th.—R.C.V.S. Written Examinations begin.

June 25th.—Meeting of the Lincolnshire Division, N.V.M.A., at Lincoln, 2 p.m.

June 29th.—R.C.V.S. Oral and Practical Examinations begin.

June 30th.—N.V.M.A. Finance and General Purposes Committee at 36, Gordon Square, W.C.1, 11.30 a.m.

July 2nd.—Meeting of the Central Veterinary Society at the Conway Hall, Red Lion Square, W.C.1, 2.30 p.m.

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The Birthday Honours

The official celebration of His Majesty's Birthday (which is on December 14th) took place on Thursday of last week, and we are pleased to note the conferment of several awards, all within the Order of the British Empire, upon members of the veterinary profession, in the Honours List issued in connection therewith. Particularly gratifying, in view of his achievement in securing the absorption of the Army Remount Service into the Army Veterinary Services under his directorship, is the honour conferred upon Brigadier Charles Allison Murray, who receives the C.B.E. Much pleasure, too, will be afforded by the awards of the O.B.E. (Civil Division) to Mr. Alexander Monro, F.R.C.V.S., Chief Veterinary Officer, Ministry of Agriculture, Northern Ireland, and of the O.B.E., in the same Division in the Dominion Services List, to Mr. Gilbert Thomas Henderson, M.R.C.V.S., Principal Veterinary Officer, Basutoland, S. Africa. In the India Office List the M.B.E. of the Order is awarded to Mr. Seth Muhammad Sarwar, M.R.C.V.S., Superintendent, Civil Veterinary Department, N.-W. F.P., Peshawar, India.

Members of the profession will also welcome the conferment of the C.B.E. in the Order of the British Empire upon Mr. W. Graham, President of the N.F.U. and Chairman of Agriculture in Scotland, and of a knighthood upon Mr. William Gavin, C.B.E., Chief Agricultural Adviser and Chief Liaison Officer to the Minister of Agriculture.

Roll of Honour

Graham.—Sgt.-Obs. G. Douglas Graham, one-time final-year student at the Royal (Dick) Veterinary College, and youngest son of Mr. and Mrs. Wm. Graham, 32, Learmonth Crescent, Edinburgh. Killed in a flying accident in May, 1942.

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R.C.V.S. OBITUARY

Barker, John, 41, Carr Road, Nelson, Lancs. Graduated N. Edin., May 30th, 1889. Died May 30th, 1942; aged 78 years.

Mr. John Barker, M.R.C.V.S.

Mr. John Barker, whose death we record with deep regret, established a practice in Nelson approximately half a century ago and became widely known and much respected by the agricultural community. He held appointments with the Nelson Corporation, the Nelson Co-operative Society and other public bodies.

At all the local agricultural shows he was a prominent figure, having a high reputation as a judge of cattle and dogs. He was a well-known breeder of Scottish and Aberdeen terriers. A keen horticulturist, he devoted most of his spare time to his garden. Mr. Barker was a member of Queen's Jubilee Lodge of Freemasons, having passed through most of the offices. He was also one of the oldest members of the Nelson Conservative Club.

Deep sympathy is extended to the widow, three sons and four daughters. Of the sons, Robert and Donald are veterinary surgeons, the former being a Past President of the National Veterinary Medical Association.

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PERSONAL

Birth.—Cooke.—To Diana (Doody Greenwood), wife of Flight-Lieut. R. G. T. Cooke, M.R.C.V.S., on June 8th—a daughter.

Appointment.—Mr. G. B. S. Heath, B.Sc., M.R.C.V.S., a graduate of the Royal (Dick) Veterinary College, has been appointed Research

Assistant in Veterinary Science in the Veterinary Department, King's College, Newcastle-on-Tyne.

. . . . .

Will.—Mr. Frederick Donald McLaren, F.R.C.V.S., of Beverley, Yorks, who died on August 25th, left £52,946. (Net personalty £52,621.) He left £2,000 to Hull Royal Infirmary; £1,000 each to Lloyd's Hospital, Bridlington, Victoria Hospital for Sick Children, Hull, and Lord Mayor Treloar's Cripples' Hospital; £500 to the National Veterinary Benevolent and Mutual Defence Society; other bequests, and the ultimate residue to the National Institute for the Blind, the Cancer Hospital, Fulham, and King Edward VII Hospital Fund.

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NATIONAL MILK IMPROVEMENT SCHEME

The Minister of Agriculture and Fisheries has appointed an advisory committee to supervise a national scheme (England and Wales) for improving the keeping quality of all milk supplies. Under the scheme, which will begin to operate forthwith, all milk delivered from farms may be sampled and tested at depots, dairies and elsewhere by a simple standard method under the administration of the Ministry.

Facilities for technical advice to milk producers and distributors will be made generally available. It is contemplated that on the basis of this scheme, when fully operative, milk produced on farms may be paid for at differential rates, milk found on test not to be of satisfactory keeping quality to be paid for at a lower rate.

The Committee is constituted as follows:—

Representing Ministry of Agriculture and Fisheries, Mr. V. E. Wilkins (Chairman), Dr. H. D. Kay (Vice-Chairman), Mr. J. A. McGilvray, and Mr. J. L. Davies; Ministry of Food, Professor E. Capstick; Ministry of Health, Mr. P. N. R. Butcher; Milk Marketing Board, Mr. T. Baxter and Mr. B. Hinds; National Farmers' Union, Mr. T. Peacock; Central Milk Distributive Committee (Milk Buyers), Mr. R. Clifford (Chairman, C.M.D. Committee), Mr. Bramwell Gates, Mr. Tudor Price and Mr. W. Bird.

New Milk Marketing and Distribution Plan

The above announcement was made shortly after the issue of a White Paper on milk policy (Cmd. 6362, Stationery Office, 1d.) giving the details of drastic changes in the marketing and distributing of milk, designed to save labour and transport.

All existing contracts between individual producers and buyers will be ended on September 30th this year. After that date the Milk Marketing Board will become the sole buyer of milk from producers, except milk used by producer-retailers for their own businesses. The Minister of Food will buy the milk from the Milk Marketing Board and simultaneously sell it to distributors and manufacturers at destinations determined by the Ministry. Retail distribution will be rationalised in all urban localities with populations of over 10,000 by requiring all dairymen serving the area to form themselves into a war-time association with the object of reducing overlapping in deliveries. The Minister of Food will pay prescribed prices to the Milk Marketing Board for all milk bought each month, and it will be for the Board to determine on what basis the total sum paid shall be distributed among individual producers—whether, that is, as a uniform price or a price subject to regional or other area variations.

The price paid to the producer will vary according to the quality of the milk, as revealed by a test of the milk. Standards of quality and testing arrangements will be prescribed and the scheme administered by the Minister of Agriculture, with the help of an advisory committee on which the interested Departments, producers, and distributors will be represented. The primary purpose of the tests will be to prevent milk of poor keeping quality passing into bulked supplies or reaching the liquid market direct, and the milk will be classified, when tested, as "Market," "Salvage," and "Rejected." Milk which is not "T.T.," "Accredited," or "Market" but is suitable for certain manufacturing purposes will be paid for at a "Salvage" price; milk not fit for manufacture will be rejected, and no price paid for it.

The Milk Movements Branch of the Ministry of Food is in charge of Mr. W. M. Hood. He has now been given a deputy, Lieutenant-General Sir Robert Gordon Finlayson (until a few months ago G.O.C., Western Command), who will take over responsibility for the scheme for rationalising retail distribution.

National Milk Testing and Advisory Scheme

In addition, the Minister has issued the following document relative to the scheme, which, it is stated, may be modified at a later date in the light of experience gained in its working.

Objects.—1. To encourage and assist milk producers and distributors to maintain a satisfactory standard of keeping quality for all milk supplies.

2. To reduce loss of milk from souring or tainting, and, in particular, to safeguard the keeping quality of bulked market milk, by segregating producers' milk which is not satisfactory for the liquid market on its arrival at the dairy, depot or creamery.

3. To arrange whenever practicable for this unsatisfactory milk to be manufactured or otherwise salvaged locally, or rejected and returned to the producer.

4. To provide a suitable basis for a scheme of differential prices to producers in accordance with the keeping quality of milk delivered.

5. To provide the Ministry of Food with information on the facilities and efficiency of depots, creameries and dairies receiving and handling milk.

6. To provide information which will enable County and Provincial Advisory services to be used to the best advantage.

Parties Concerned.—1. The responsibility for administering the scheme will rest with the Ministry of Agriculture and Fisheries.

2. The Ministry will provide technical advisers and inspectors to ensure that the technical control of the scheme is impartial.

3. The Ministry will do its utmost to see that the County Advisory services are adequate to give advice to producers whose milk fails in the test.

Advisory Committee.—A Committee, consisting of representatives of the Ministries of Health, Food and Agriculture, the Milk Marketing Board, the Dairy Trade and the National Farmers' Union, will advise the Ministry of Agriculture and Fisheries on the operation and development of the scheme. The Committee will appoint a technical sub-committee to report and advise on all technical aspects of the scheme.

Nomenclature.—The following categories of producers' milk are proposed:—

1. "Market" milk—satisfactory for the liquid milk market.
2. "Salvage" milk—unsuitable for the liquid market.
3. "Rejected" milk—to be returned to the farmer.

Procedure.—All supplies of milk, including designated milks, delivered from farms to whatever destination shall be liable to be submitted to test.

The methods of sampling and testing shall be approved and standardised throughout the country. The testing will be done, as far as is practicable, in trade laboratories. Since the testing may lead to price differentiation, the laboratories will be licensed on behalf of the Ministry of Agriculture and Fisheries.

The form of licence will be prepared by the Ministry of Agriculture and Fisheries, the principal conditions being that the laboratory facilities shall be approved by the Provincial Dairy Bacteriologist and that each certificated tester employed on carrying out the standard tests, shall be similarly approved. Where dairymen possess their own laboratories and scientific staff these shall be approved, provided they comply with the conditions set out in the licence and certificate. Where dairymen do not possess laboratories or scientific staff certificated testers shall be appointed to test the milk at the point of first delivery (or in the case of producer-retailers before sale to the consumer), unless such dairymen are able to make arrangements with other dairymen within defined areas possessing laboratories and qualified staff to undertake the necessary testing on their behalf. Licences and certificates will be issued by the Ministry of Agriculture and Fisheries to all dairies complying with the prescribed conditions and to such personnel as is necessary. Certificated testers, whether in the dairy's own laboratory or operating independently as described above, will carry out the standard tests under the control and supervision of the Provincial Dairy Bacteriologist, who will arrange for frequent check tests to be made by his own staff. Both the tester's certificate and the licence of a laboratory will be subject to the continued approval of the Ministry.

Testing and Recording.—On arrival at the collecting depot, creamery or dairy, each producer's milk will be inspected by the platform examiner, who will set aside all milk which, in his opinion, is of doubtful keeping quality or possesses undesirable taints. This milk will be sampled and tested forthwith by a certificated tester using the approved methods and the result entered in the records. The tester may also sample and test any other milk supply reaching the depot and record the result.

It is intended that the above procedure should supplement, rather than replace, any routine sampling and testing, at regular intervals, of all milk handled at any depot or dairy. It is suggested, however, that the approved standard tests should be used in all cases.

It shall be an obligation set out in the conditions of approval of a trade laboratory participating in this testing scheme that records of all tests made shall be preserved for twelve months in a manner to be determined. Laboratories must at once notify the producer and the appropriate County Agricultural Executive Committee of any supply which either fails to pass the test for market milk or is a borderline case.

Finance.—The Ministry of Agriculture and Fisheries will provide for the cost of the County and Provincial services required under the scheme. Owners of licensed laboratories will meet the cost of testing the milk of producers received direct at their depot or dairy. Owners of licensed laboratories may undertake, for a small fee, the testing of producers' milk received direct at depots or dairies which do not possess a licensed laboratory.

Price Differentiation.—As soon as practicable the scheme will be extended to include differentiation in milk prices on a quality basis. This differentiation will be decided by the Ministry of Food in consultation with the Milk Marketing Board. The conditions under which price differentiation will operate shall be determined on the advice of the Advisory Committee.

Use of Milk Failing the Test.—"Salvage" Milk.—This milk will be at the disposal of the Ministry of Food, who will, whenever practicable, arrange for its salvage manufacture or disposal. If salvage is impracticable the milk will be returned to the producers. The Ministry of Food will determine the price to be paid by the manufacturers or other users for salvage milk.

"Rejected" Milk.—In all cases this milk will be returned to the producers.

Advisory Service.—The results of tests carried out at the approved laboratories will be submitted at weekly intervals to the appropriate County Agricultural Executive Committee, who will make arrangements for any necessary advisory visits to be paid to the farms. These producers will be informed of the results and that an advisory visit will be made to discuss ways of improving their methods of production. The Provincial Dairy Bacteriologist will also be available to co-operate with the County Staffs and to investigate any technical problems arising at collecting depots which may be adversely affecting the standard of bulked milk destined for the liquid milk market.

Priority.—The scheme will at its inception be applied mainly to depot or creamery bulked milk destined for distant markets, but as stated above, all supplies of milk, including designated milks, delivered from farms will be liable to test.

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Dr. F. C. Minett, Director of the Imperial Veterinary Research Institute, Mukteswar, has been elected President of the Medical and Veterinary Sciences section of the 1943 session of the Indian Science Congress, to be held in Lucknow during January 2nd to 8th, 1943.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.
The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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NEOPLASIA ?

Sir,—Upon his evidence published in this journal of June 13th, p. 240, I am unable to agree with Mr. J. E. Kenny's diagnosis of primary adenocarcinoma of the mammary gland in a 10-year-old cow. I would suggest that the changes as illustrated by the eight photomicrographs of mammary gland, lymph gland and lung are those of hyperplasia and metaplasia, not neoplasia. I wonder if Mr. Kenny would have any objection to submitting his sections for confirmatory diagnosis to Drs. Gye or Ludford, of the Imperial Cancer Research Fund. The rarity of mammary cancer in the milch cow makes it most important that there should be no dispute over the diagnosis.

I have the honour to be, Sir,
Yours obediently,
TOM HARE.

529a, Finchley Road,
London, N.W.3.
June 15th, 1942.

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MEMORANDUM C.S.3

Sir,—Two points in the very clear and concise Memorandum C.S.3 have caused me—and probably many others—grave concern. The first is the proviso that live abortion vaccine may be used in non-graded herds where *Br. abortus* is diagnosed *on clinical grounds only*. It was surely precisely this procedure which brought the use of live vaccine into such serious disrepute in its earlier days, when its indiscriminate use spread contagious abortion broadcast.

The second point is the permission to diagnose mastitis due to *Str. agalactiae* on clinical grounds only; I can imagine anyone with five years' experience of the disease having the temerity to do so, but scarcely after ten years or more.

The inauguration of the Control Scheme has placed such a staggering responsibility on shoulders barely broad enough to bear it, that I am almost shocked that these loopholes for error and consequent criticism have been left.

In none of the valuable material recently published on infertility have I seen any reference to the use of wheat germ oil in the treatment of this condition. Why not?

Yours faithfully,
PAUL CROSFIELD.

Chipping Norton,
Oxon.
June 14th, 1942.

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JOURNAL OF COMPARATIVE PATHOLOGY AND THERAPEUTICS

Sir,—The Editorial Board designated by the late Sir John M'Fadyean to continue the Journal has assumed responsibility for publication according to the wishes of his trustees. The Board has decided to recommence publication immediately.

For the benefit of subscribers and contributors the Board will be glad if you will find space to publish the following notice which will appear inside the cover of the first re-issue of the Journal.

We are,
Yours faithfully,
J. G. WRIGHT.
T. J. BOSWORTH.
J. T. EDWARDS.
R. E. GLOVER.

1. The columns of the Journal are open for contributions dealing with veterinary science. Papers having a direct bearing on this subject are acceptable.

2. The Editorial Board accept papers on the understanding that they are offered to the *J.C.P.T.* alone and reserves the right to reject contributions submitted for publication. During the period of the war it is essential that all articles shall be as concise as possible.

3. Citation of literature in the text should be accompanied by the year of publication. Authors' names (followed by year, publication, etc.) should be arranged alphabetically in a list at the end of the paper.

4. Papers for publication, exchange journals, etc., should be sent to Professor T. J. Bosworth, The Beeches, Streatley, Berks, or to any member of the Editorial Board.

5. Correspondence concerning business matters should be addressed to the Publishers, Messrs. H. R. Grubb, Ltd., Poplar Walk, Croydon, Surrey.

6. For the convenience of former subscribers, libraries, etc., volume 52, of which one part was published in March, 1940, will be completed. Part 2 will be dated June, 1942, and parts 3 and 4 will be published as material becomes available. The price is 6s. per number or 15s. 9d. for the three parts.

7. Beginning with volume 53 the price of each number will be 6s.; the net price of each complete volume of four parts will be £1 1s. paid in advance to the publishers. Additional copies and reprints ordered before the issue is printed may be obtained from the publishers.

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HOME OFFICE INSPECTORATE: A FIELD FOR THE VETERINARIAN

Sir,—At the end of June a somewhat rare event will take place. The Home Office will make an appointment under the Cruelty to Animals Act, 1876, which regulates the practice of experiments on living animals.

May I call attention to the importance of ensuring that the inspector appointed shall have, in addition to the requisite scientific knowledge, a genuine sympathy for animals, as evidenced by his having in the past effectively associated himself with efforts for the betterment of their lot in some field or other? Preferably, too, he should have veterinary knowledge.

An inspector under the Act exercises an important function, not, indeed, as a policeman, but in advising research workers as to the interpretation of their obligations in particular cases. In view of the number of experiments licensed under the Act, direct supervision is not practicable on any material scale, but I assume that the majority of research workers do not desire to contravene the regulations, and that the inspector's guidance will in general be effective.

The Act is a compromise between the claims of science, on one hand, and the rights of animals on the other. The line drawn in the practical application of this compromise must inevitably be an arbitrary one. Until somebody can lay down clear-cut rules which will command general assent, the best that can be done is to make as fair a compromise as possible. This calls for exceptional impartiality, and since a man with the indispensable scientific training will necessarily have a predisposition in favour of science, it is important that he shall also have an offsetting predisposition in favour of the other party in the compromise. This could be ensured by requiring candidates for the post to prove that they have in the past been effectively associated with some effort to better man's treatment of animals, wild or domestic.

Yours faithfully,
P. CHALMERS MITCHELL,
President.

The Universities Federation for Animal Welfare,
284, Regent's Park Road,
Finchley,
London, N.3.
June 8th, 1942.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
May 1st to 15th, 1942	12	1	—	5	23
Corresponding period in—					
1941 ...	32	9	—	11	36
1940 ...	20	—	1	4	162
1939 ...	29	—	1	4	126
Total Jan. 1st to May 15, 1942	126	12	26	110	164
Corresponding period in—					
1941 ...	216	218	7	125	675
1940 ...	234	18	12	109	1,458
1939 ...	367	29	26	146	618

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.